TECHNICAL NOTES

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The Accuracy of Southeast Alaska Site Index Estimates
Associated with Variable Numbers of Height Measurements

It was desired to know the number of height measurements of dominant and codominant trees which would be required to estimate site index within a given degree of accuracy in coastal hemlock-spruce stands of Southeast Alaska. Employing the methods used by Johnson and Carmean[1] a test was conducted in this region.

Data were available from thirty-two 1/5-acre rectangular yield plots established in even-aged stands throughout the region. Average age ranged from 31 to 170 years. Six height measurements of dominant and codominant trees were taken on each plot. Plot site indices ranged from 57 to 150.

Within-plot standard deviation was calculated for each plot. Average within-plot standard deviation for all 32 plots was $\pm$ 8.11 site index units. Standard errors and errors at the 95 percent level of fiducial probability were then calculated for variable values of "n" (table 1).

Table 1.--Expected errors in site index associated with
number of height measurements per area

No. of height measurements per area	Standard error	Sampling error at the 95 percent level of fiducial probability
	Site index units	Site index units
3	4.68	20.14
4	4.05	12.89
5	3.63	10.08
6	3.31	8.51
7	3.07	7.51
8	2.87	6.79

[1] Johnson, Floyd A., and Willard H. Carmean, 1953. Sampling error in the estimation of site index. Jour. Forestry, Vol. 51(1):26-27.

Variations in Site Index Estimates in Even-aged Stands of Southeast
Alaska Due to Differences in Height Growth of Spruce and Hemlock

Estimates of site index were found to vary depending upon whether Sitka spruce or western hemlock was used for height measurements.

Eighteen 1/5-acre plots were available in even-aged stands on which height measurements of 3 spruce and 3 hemlock dominants and codominants had been taken. These plots were scattered throughout the southern half of Southeast Alaska. They ranged in age from 31 47 years. From these data a linear regression comparing plot site index as deter-d by spruce versus site index as determined by hemlock was calculated using the method of least squares (fig. 1).
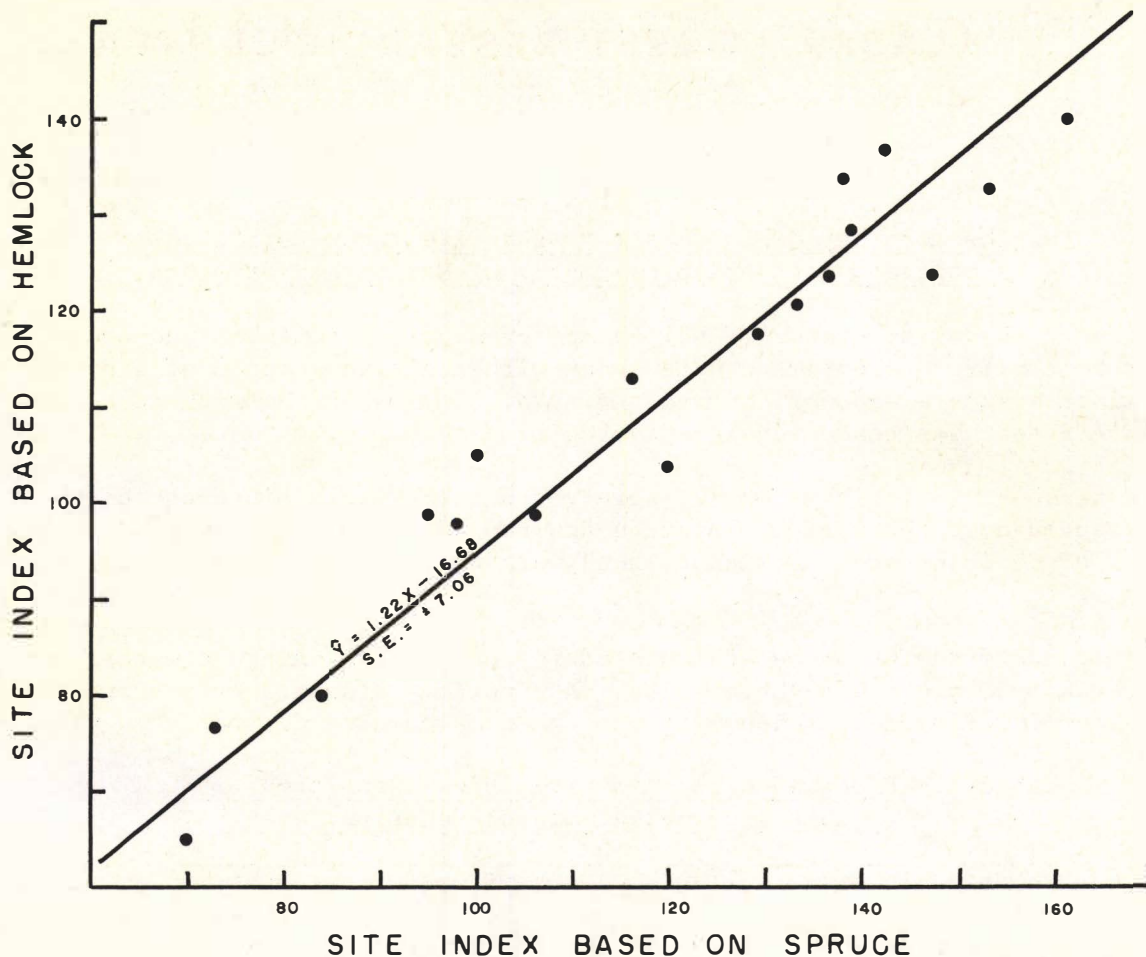
Fig. 1--Regression analysis showing relationship between
site index as determined from 3 height measurements
of Sitka spruce versus site index as determined from 3
height measurements of western hemlock on the same plot.

Site index estimates tended to be higher when based on spruce. The difference increased as site index increased. Below site index 100 the difference is negligible. Above site index 100 the difference becomes quite large involving a considerable difference in yield table predictions.

Values in the yield tables are referred to site indices obtained from height measurements of spruce and hemlock together. It is therefore suggested that when using the yield tables, site indices should be estimated from an equal number of height measurements of spruce and hemlock rather than mostly from one species alone. This is most important in high site index stands where variation in height of the two species is greatest.

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